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**FORCE XXI AND BEYOND:  
BRIDGING THE COMBAT POWER GAP WITH FIRES**

**BY**

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USAWC STRATEGY RESEARCH PROJECT

**Force XXI and Beyond:**

**Bridging the Combat Power Gap with Fires**

by

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## **ABSTRACT**

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As we near the 21st Century, many influential leaders in the United States believe that war against a major military power is unlikely. These same leaders believe it's also unlikely that the United States will have to fight two nearly simultaneous conflicts in different theaters of war. These beliefs combined with budgetary pressures make significant Army force structure reductions a certainty. The Army, in an effort to maximize its capabilities, will discard the unwieldly division. It will adopt a combined arms brigade as its basic tactical unit and rush to embrace technology to make the brigade as formidable as possible. The current technological focus is on information dominance and speed, which many Army leaders believe are the keys to victory on the 21st Century battlefield. Unfortunately, budget issues, technology shortfalls, and the rise of technologically and militarily advanced enemies may place the smaller U.S. Army in grave danger of losing a war on a future battlefield. However, major advances in fire support have the potential to provide the smaller U.S. forces the additional combat power they need to defeat a larger, technologically advanced enemy.



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**FORCE XXI AND BEYOND:**

**BRIDGING THE COMBAT POWER GAP WITH FIRES**

The tendency towards under-rating firepower ... has marked every peace interval in modern military history.

— Sir B. H. Liddell Hart

This quote was true when B. H. Liddell Hart wrote it in 1944 and may be more accurate today as we rush headlong into the 21st Century with visions of information dominance and lightning fast maneuver forces shaping our view of the future battlefield.

While Army Vision 2010 addresses precision engagement with fires as a key contributor to 21st Century land component operational success<sup>1</sup>, many Army leaders and military analysts seem to be focusing more on maneuver and information warfare as the real keys to success on the 21st Century battlefield. Unfortunately, a rush to embrace leap ahead technology in maneuver and information dominance may leave our Army with a gap in its combat capabilities that could chill the bones of even the stoutest maneuver-information dominance advocate and leave the United States on the losing side of a 21st Century war.

## **21<sup>ST</sup> CENTURY FORCE STRUCTURE:**

### **THE DEATH OF THE DIVISION**

As the Army begins to focus on Force XXI, the vision of the Army in the early 21st Century, and the Army After Next, the Army that will follow Force XXI, it's clear that both evolutionary and revolutionary changes are imminent. Evolutionary changes occur through improvements to existing equipment, organizations, and doctrine, but there is still obvious continuity between the old and new. Revolutionary changes involve completely new thoughts, new equipment, and new ways to fight, with no clear tie to the last generation.<sup>2</sup> The Army will initially face evolutionary change as it moves into the next century and progress to revolutionary change as new technologies provide new capabilities.

The most significant early changes will probably involve force structure and how the Army organizes its forces for combat. There are several reasons for this. First, it's easy today for political leaders and academicians as well as the common citizen to make the argument that we no longer need a large Army of heavy armored forces. Our 40-plus year face-off with the massive armies of the Soviet Union is over. We're the victor, and there's currently no other military superpower to threaten us with a large-scale, high intensity ground war.<sup>3</sup>

With the Soviet Union gone, the military has shifted its focus from fighting a world war against a superpower to regional stability operations with the most likely threat being a rogue nation, like Iraq, trying to become a regional hegemon or an unstable regime, like the one in North Korea, starting a war in a misguided attempt to stave off internal collapse. In the worst case, two of these regional or major theater wars (MTWs) would occur almost simultaneously in regions involving vital U.S. interests.<sup>4</sup> This worst case scenario has driven Army force structure for years, but recently, many influential leaders have begun to question the two MTW strategy. The National Defense Panel, in its December 1997 report, stated the two MTW strategy, while appropriate for the Cold War, "is fast becoming an inhibitor to reaching the capabilities we will need in the 2010-2020 time frame" and that it's actually not a strategy at all but a ploy to retain unneeded force structure.<sup>5</sup>

Budgetary concerns however, seem the ultimate driving force behind efforts to cut force structure. Even some senior military officials advocate reducing the Army to eight or even six divisions in order to free a large amount of money for reappropriation into high technology research and development or procurement.<sup>6</sup> With no threat of a major war looming on the horizon and many beginning to question the validity of a two MTW strategy, this is a powerful argument, especially if we believe

we'll receive support from the United Nations or local allies during a regional conflict.

With reduced force structure likely, the Army is looking at ways to maximize its capabilities. The division, the Army's basic tactical formation since the Civil War, may be too large and unwieldy for 21st Century battlefields.<sup>7</sup> Force reductions and emerging technology giving smaller units more capability make it likely the Army will replace the division as its base tactical unit. Even though the Army plans to retain the division as it initially develops Force XXI, it will almost certainly transition to a smaller basic tactical unit as it moves toward the Army After Next.<sup>8</sup> A combined arms brigade or similar formation is the likely candidate to be the primary tactical unit of the future. Army Colonel Doug Macgregor has written a compelling book, Breaking the Phalanx: A New Design for Landpower in the 21st Century, that advocates a brigadelike, combined arms "group" as the basic tactical unit of the 21st Century Army. Colonel Macgregor believes the current divisional organization will severely limit the exploitation of emerging technology.<sup>9</sup> In his vision of the 21st Century Army, other specialized combat, combat support, and combat service support groups would support the combat maneuver groups in lightning fast offensive operations that would quickly defeat an adversary.<sup>10</sup> While not everyone in the Army's leadership agrees with Macgregor, there are prominent senior leaders, including the Army's Chief of Staff, General

Dennis Reimer, who feel Macgregor is headed in the right direction.<sup>11</sup> Other articles have also begun to appear supporting a brigade-based force, including one in the U.S. Army War College Quarterly, Parameters, entitled "The Brigade-Based New Army," by John R. Brinkerhoff<sup>12</sup>, and General Reimer and several other Army four star generals discussed the concept at an April 1997 Army "Board of Directors" meeting.<sup>13</sup>

The concept of shifting to brigade-based operations may also be moving past the discussion stage, even if it's occurring without a conscious decision on the part of the Army's leaders. The Army has begun to train brigade-sized units at the National Training Center at Fort Irwin, California, and there are two stand-alone brigades at Fort Riley, Kansas, that contain all the elements of a combined arms brigade - armor, mechanized infantry, artillery, engineer, and maintenance battalions. These two brigades are capable of deploying from Fort Riley to any theater of war and fighting as part of any division or Joint Task Force. Finally, and possibly most telling, the Army selected a brigade from the 4<sup>th</sup> Infantry Division (Mechanized) at Fort Hood, Texas, as the basic unit to begin its Advanced Warfighting Experiment (AWE), the precursor to Force XXI. The Army will use the test results from this brigade to make many decisions about Force XXI including its force structure.<sup>14</sup>

The United States is not alone in facing this trend toward smaller basic tactical units. At least two of our more steadfast

allies, the British and the Germans, have already moved away from the division toward the combined arms brigade as their primary combat unit.<sup>15</sup> It seems clear the U.S. Army is headed in the same direction. Budgetary concerns, the absence of a superpower enemy, the belief that simultaneous conflicts in two theaters of war is unlikely, and the apparent potential of technology to increase the effectiveness of smaller units make it likely the Army will replace the division with the brigade or a brigade-like force early in the 21<sup>st</sup> Century.

#### **FORCE XXI:**

#### **THE BEGINNING OF THE INFORMATION WARFARE ARMY**

Possibly more important than the actual size of the basic combat unit is how the Army plans to win 21<sup>st</sup> Century wars. The answer lies in revolutionary change through technology with Force XXI the first product of that change. Force XXI will be versatile, rapidly deployable, tailorable to the threat, and able to operate seamlessly with the other services.<sup>16</sup> It will incorporate revolutionary command and control changes by enhancing battlefield awareness throughout the entire force by maximum utilization of modern information technology.<sup>17</sup> The entire force will be "digitized", which "involves the use of modern communications capabilities to enable commanders, planners, and shooters to rapidly acquire and share

information."<sup>18</sup> Numerous sensors across and above the battlefield, from satellites to ground sensors to unmanned aerial vehicles, will see both enemy and friendly forces and transmit this information through digitized communications systems. This technology will eventually give friendly forces a nearly perfect realtime picture of the battlefield. They'll have the tremendous advantage of being able to see themselves and see the enemy, and commanders at all levels will be able to communicate orders nearly instantaneously through digital communications links to all subordinate elements. This improved battlefield awareness and communications capability will "revolutionize the conduct and tempo of battle"<sup>19</sup> and will give Force XXI the ability to react faster and more effectively than a less technologically advanced enemy.

Moving as fast as possible toward Force XXI, the Army sent its experimental brigade from Fort Hood to the National Training Center (NTC) in March 1997. It conducted simulated combat operations against the NTC's world class Opposing Force, a live enemy that routinely "destroys" Army units that come to the NTC to train. While the results of the test were mixed, the brigade clearly showed the tremendous potential of a unit with a perfect picture of the battlefield and instantaneous digital command and control systems.<sup>20</sup>

Progress on Force XXI technology, operations, and doctrine is moving rapidly. The Army originally planned to field an entire

digitized corps by 2006. Now the Army believes it can accelerate this process and field the first Force XXI corps, if corps-sized units still exist, as early as 2004 or 2005,<sup>21</sup> but even more revolutionary change will take place in the 2010 to 2015 time frame.

#### **ARMY AFTER NEXT:**

##### **KNOWLEDGE AND SPEED DEPENDENCE**

By 2010, the Army will exploit the Force XXI effort to achieve nothing less than a technological and cultural metamorphosis. By then, over a decade of experimentation and field exercises will create a knowledge-based force, Army XXI, balanced across our traditional imperatives and possessed with a clarity of observation, degree of decentralization, and pace of decision making unparalleled in the history of warfare. AAN simply seeks to provide the Army of 2020 with the physical speed and agility to complement the mental agility inherited from Force XXI.<sup>22</sup>

This quote, taken from The Annual Report on the Army After Next Project to the Chief of Staff of the Army (July 1997), shows the characteristics the Army expects Force XXI, or by 2010 Army XXI, to have. It will be a "knowledge-based force" reliant on information dominance to win the land war. Its nearly perfect C4I structure will give it a perfect picture of the battlefield and allow it to execute combat operations at a much faster pace

than potential adversaries. The period around 2010 will see even more change.

Chief of Staff of the Army, General Dennis Reimer, uses his Vision 2010 to explain how the Army will continue its progression from Force XXI to AAN. While he says that "full spectrum dominance" will be the mark of the Army in 2010, he makes it clear that information dominance will be the foundation of success in combat operations.<sup>23</sup> AAN will use that information dominance, the experience gained in 10 years of Force XXI operations, and new technology as a springboard for even greater revolutionary change.

As the 1997 Annual Report on the Army After Next says, among other changes, AAN will seek to add pure physical speed to the fast decision cycle of Force XXI.<sup>24</sup> Where information dominance was the principal key to success for the Force XXI Army, AAN will exploit that information dominance and new technology to develop tremendous speed of maneuver. This physical speed combined with the rapid decision making allowed by information dominance will give AAN tremendous speed, the essential element for success on the AAN battlefield.<sup>25</sup>

In studying the future battlefield during FY97, the Army conducted a series of war games at Fort Leavenworth and Carlisle Barracks. These computer simulation games were free-play exercises with an opposing "red" force that was not artificially restricted.<sup>26</sup> The players used forces projected to be available

in the 2020 timeframe. Blue forces, the AAN forces, used maneuver systems "capable of order-of-magnitude increase in speed."<sup>27</sup> They did this by combining air and ground movement and could achieve speeds of up to 200 kilometers an hour.<sup>28</sup> The most significant findings of the Leavenworth game, a tactical and operational level game, were that knowledge (information) dominance allowed dramatic maneuver speed<sup>29</sup> and that speed of maneuver was the "most important factor contributing to battlefield success."<sup>30</sup>

Clearly, The Annual Report on The Army After Next states that knowledge, derived through information dominance, and speed, allowed by that knowledge and new technology, are the essential characteristics of the Army After Next. In other words, to win on the battlefield of 2020 and beyond, our Army will rely on its nearly perfect picture of the enemy and itself and on tremendous maneuver speed. While the reasons are compelling for the Army to head in that direction, this absolute reliance on knowledge and speed coupled with reduced force structure has threads of disaster interwoven into the fabric of change.

#### **THE POTENTIAL COMBAT POWER GAP:**

#### **A PERFECT PICTURE OF OUR OWN DEFEAT**

While the potential exists for Force XXI and AAN to be absolutely dominant on the battlefield, there is also potential

for the Army to find itself with a deficiency in its combat power that could result in a devastating defeat. This deficiency could take two forms. First, projected knowledge and speed capabilities may not be adequate to defeat a 21st Century adversary. This represents a gap between U.S. combat power and that of an enemy. The second form of combat power deficiency would be between our knowledge dominance and our ability to act on that knowledge. This would create a gap between anticipated and actual combat power. Either could be decisive on a 21st Century battlefield.

There are three situations that could result in a combat power gap or asymmetry:

1. **Emergence of an enemy with similar capabilities.** With the collapse of the Soviet Union, many seem to believe there will be no significant threat to the U.S. in the early 21st Century.<sup>31</sup> Although currently there is no military power to rival the U.S. Army, that may not be the case in the not too distant future. As The Annual Report on the Army After Next acknowledges, both China and a resurgent Russia could have the economic potential to develop militaries that could challenge the U.S., possibly before 2020.<sup>32</sup>

China is especially worrisome. It may or may not be able to completely match U.S. technology in the next 20 to 30 years, but even if it can't, its very large army would be a formidable foe. It will also likely have the type of government that would be

willing to use military power, even if the Communist Party doesn't retain absolute control.<sup>33</sup> Even more worrisome, it's unclear just how hard it would be for a country with money to spend to develop or buy the information technology the U.S. is counting on to allow its smaller forces to dominate the battlefield.

**2. Development of cheap countermeasures to U.S. information-dominance technology.** Developing or buying the same technology that gives the U.S. information or knowledge dominance may not even be necessary. All a potential foe really has to do is develop, or more likely buy, countermeasures that negate U.S. technology, even if only for short periods. It's an alarming thought that a country like Iraq or Iran might eventually have considerably larger ground forces than the U.S. and might be able to buy technology from the Chinese, Russians, or even a nominal U.S. ally that could "deprive U.S. forces of the assurance of rapid battlefield dominance."<sup>34</sup>

**3. Army inability to take advantage of information dominance.** Turning our attention to the second form of combat power gap, one in which the U.S. Army's planned or perceived combat capabilities did not match actual capabilities, suppose the Army can gain information and consequently knowledge dominance but doesn't have the ability to take advantage of it. This may not be too farfetched.

A 1996 assessment by the Army Armor Center at Fort Knox, Kentucky, stated that the M1 Abrams, the Army's main battle tank, is not able to meet the requirements needed in the main battle tank for Force XXI and definitely not for AAN. The Army also estimates that two-thirds of the M1s in the inventory are only marginally capable of defeating new antitank threats in Eurasia. To make a bad situation worse, funding to upgrade the M1 has been a continual problem. Budget issues recently forced the Army to remove almost \$800 million from the last three years of the budget plan covering FY98-03 M1 upgrades.<sup>35</sup>

Alarmingly, the Army won't be able to field a new tank for some 20 years, surprisingly enough because of technology, or more accurately, a lack of technology. "The Army Science Board, in a May 1996 study of tank modernization, said, 'A careful study of new technology failed to show a breakthrough for tank improvements before 2020.'"<sup>36</sup> The absence of breakthrough tank technology is an ominous sign that neither Force XXI nor AAN will have the main combat vehicle it needs to exploit knowledge dominance. Add to that the likelihood of a smaller overall force and a smaller basic tactical unit, and the Army may have a prescription for disaster.

What could happen is quite simple. Let's project forward to 2010 and look backward at a highly likely scenario. In the 2002 to 2008 timeframe, a promise of a technologically superior Army coupled with the lack of a major threat and budgetary pressures

caused a reduction in Army force structure, first to eight and then six divisions. Army leadership, in an effort to gain maximum effect from the rapid execution of decentralized operations allowed by information dominance, adopted the combined arms brigade as its basic combat unit in 2009. Unfortunately, the M1A6 Abrams, the primary combat vehicle of Army XXI, suffered throughout the entire period from lack of funding for additional upgrades, and its readiness rates posed a significant challenge to commanders at all levels. Nevertheless, most of the Army's combat leaders in 2010 remain convinced that Army XXI's information dominance will give them a decisive edge by allowing them to execute combat operations faster than any potential enemy.

In reality, a conflict against an expansionist, economically powerful China in the next decade, 2011 - 2020, could pose a serious threat to this Army. Although much smaller than its army of today, a modernized Chinese army of 25 divisions armed with new tanks and advanced technology will be a tough enemy. Even if the six division U.S. Army gains information dominance, will it be able to defeat a Chinese army four times its size? Will the aging M1 Abrams be a match for a modern Chinese tank? If not, it's doubtful if any positional advantage gained through a perfect picture of the battlefield will offset the numerical advantage of an opponent armed with a tactically comparable tank. Worse, if the Chinese have technology enabling them to match or

negate U.S. information capabilities, they'll have a decided advantage.

If the picture of a modern, information-warfare capable China is too hard to envision, consider the more likely scenario of a war against a Southwest Asian enemy, either Iraq, after United Nations' sanctions are lifted, or Iran. A resurrected Iraqi army or the Iranians, both with large armies composed of modern tanks purchased from China or Russia and technology capable of neutralizing U.S. information dominance, also purchased on the open market, could be a formidable foe for the small, information-dependent U.S. Army.

Are knowledge gained through information dominance and speed of maneuver the keys to success on the 21st Century battlefield as The Annual Report on the Army After Next says?<sup>37</sup> The answer is probably yes. Unfortunately, it's entirely possible the U.S. Army won't be able to gain information dominance if it fights an enemy with comparable technology or technology capable of neutralizing U.S. advantages. Even if the U.S. can gain information dominance, will its small, brigade-based Army be capable of defeating a larger, modern enemy? The answer is likely to be no, especially if the M1 Abrams remains the main battle tank well into the next century as appears will be the case. The Army could find itself in a situation where it has a perfect picture of its own defeat, simply because it can't match the enemy's combat power.

So there is great potential for a combat power gap. Either projected knowledge and speed capabilities won't provide enough of an advantage to defeat a larger, technology advanced adversary, or there could be a gap between our knowledge dominance and our ability to act on that knowledge. In either case, the results could be devastating, but what can the Army do? Is there a way to counter these potential problems and bridge this combat power gap?

#### **BRIDGING THE GAP WITH FIRES:**

#### **DEVASTATING POWER TO PRESERVE AND ENHANCE OUR ADVANTAGE**

Maneuver and firepower are inseparable and complementary dynamics of combat. Although one might dominate a phase of the battle, the synchronized effects of both characterize all operations.

Maneuver is rarely effective without firepower...

Firepower provides destructive force; it is essential in defeating the enemy's ability and will to fight.

— FM 100-5 Operations

The Army really doesn't have to look far to find a possible solution. FM 100-5, The Army's premiere manual on doctrine, provides basic insight on combat power the Army must not forget. It clearly states firepower is a key element of combat power.<sup>38</sup> In its rush to embrace information age knowledge and speed, is

the Army forgetting this basic principle? The Annual Report on the Army After Next says "...if not corrected soon, the current emphasis on a method of warfighting that emphasizes firepower at the expense of maneuver may well result in a protracted war characterized by stalemate, attrition, and unacceptable loss of life to both sides."<sup>39</sup> Clearly, the report shows the belief that success in 21<sup>st</sup> Century warfare will rely predominantly on knowledge and speed. Unfortunately, this emphasis on knowledge and speed may lead to such a significant gap in combat power that the U.S. Army is unable to defeat a 21<sup>st</sup> Century enemy. The way to bridge that gap is through fires.

Artillery, once called the king of battle, lost much of its effectiveness in the latter 20<sup>th</sup> Century with the rise of heavy mechanized units as the preeminent combat force. Artillery, however, will make tremendous leaps forward in the 21<sup>st</sup> Century, as will other methods of fire support. These tremendous advances, if not sufficient to allow artillery to regain its crown as king of battle, will at least elevate fire support to the level of crown prince and help Force XXI and AAN develop the combat power necessary to defeat any 21<sup>st</sup> Century foe.

These unprecedented improvements in fire support will occur in five major areas. These include cannon artillery, rocket and missile artillery, joint fire support systems, targeting and fire control. An awareness of the advances in each area is essential

in understanding how they can magnify the combat power of our 21<sup>st</sup> Century Army.

**1. Cannon Artillery.** The Crusader, the Army's 21<sup>st</sup> Century field artillery system, will revolutionize cannon artillery fires. The current artillery system, the M109A6 Paladin, is the seventh variant of the 155mm howitzer the Army fielded in the 1960s. Granted, its onboard ballistic computer and navigation system and its automatic gun positioning give it capabilities undreamed of by artillerymen of the 1960s<sup>40</sup>, but the Crusader, under development and scheduled for fielding in 2005,<sup>41</sup> will revolutionize cannon support for Force XXI and AAN.

Crusader will combine 21<sup>st</sup> Century communications systems, on board technical fire direction capability, enhanced situational awareness and decision aides, global positioning navigation systems, automatic loading and gun positioning, and exceptional speed with revolutionary firing capabilities. Its three-man crew (down from the five to nine needed for an M109 system) will produce an enormous volume of fire to a range of 40 or more kilometers with unprecedented speed.<sup>42</sup> In a recent comparison of rates of fire, an experienced Paladin crew fired 15 rounds in nine minutes and 52 seconds. A crew in a Crusader simulator fired 15 rounds in one minute, 43 seconds.<sup>43</sup> Even more beneficial in a 21<sup>st</sup> Century fight against a larger enemy force is Crusader's ability to fire Multiple Round Simultaneous Impact (MRSI) missions in which one Crusader can fire four to six rounds

that impact on the same target at approximately the same time.<sup>44</sup> This incredible volume of fire will give a 21<sup>st</sup> Century Crusader battalion of 18 guns the same combat power as a division artillery composed of three Paladin battalions.<sup>45</sup>

Advanced munitions will make Crusader even more effective. In the latter half of the 20<sup>th</sup> Century, state-of-the-art armor greatly diminished the lethality of field artillery. In the 21<sup>st</sup> Century, new munitions promise to vastly increase the already formidable lethality of Crusader. The most promising cannon munition under development is the Sense and Destroy Armor (SADARM) projectile.<sup>46</sup> Fired over a target area, SADARM combines active and passive millimeter wave and infrared technology to locate an armored vehicle target<sup>47</sup> and then destroys the target by firing an explosively formed penetrator through its top.<sup>48</sup> SADARM is five times as efficient as the Army's current armor-killing munition, the Dual Purpose Improved Conventional Munition.<sup>49</sup> Tests in Alaska in August 1997<sup>50</sup> were completely successful in all types of weather,<sup>51</sup> and the Army will have enough SADARM munitions available to employ them in combat by FY99.<sup>52</sup> The product improved SADARM, available by FY02, will have improved sensors, search a larger target area, and nearly double original SADARM effectiveness.<sup>53</sup>

Crusader, especially when combined with munitions like SADARM, will exponentially improve the combat effectiveness of

Force XXI and AAN. The former commanding general of the Army's Training and Doctrine Command, General (Retired) Fred Franks, summed it up best when he said,

The combination of Crusader capabilities, when coupled with digital linkage and global positioning, is the leap ahead we want. This is revolutionary. It gives the maneuver commander levels of lethality and responsiveness never before available through fire support.<sup>54</sup>

Crusader's capabilities also present maneuver commanders with beneficial second and third order effects. Army simulations show Crusader's ability to destroy enemy systems at greater ranges reduces the number of direct fire engagements by as much as 40 percent, gives friendly maneuver units unparalleled freedom of maneuver,<sup>55</sup> and dramatically reduces friendly casualties.<sup>56</sup>

**2. Rocket and Missile Artillery.** Crusader won't be the only highly lethal artillery system on the battlefield. The 21<sup>st</sup> Century Army will also have the Multiple Launch Rocket System (MLRS) and the Army Tactical Missile System (ATACMS). These systems will have significant evolutionary changes that greatly improve their ability to help bridge the combat power gap between friendly and enemy forces.

The new MLRS will greatly reduce already fast fire mission response and reload times, but the most notable improvement will be an increased range and accuracy. The current 30 kilometer range will increase to 45 kilometers,<sup>57</sup> and in FY99, the Army will enter the engineering development phase of the Guided MLRS

(GMLRS) rocket,<sup>58</sup> which will have a guidance and control package that allows it to attack point targets with deadly accuracy out to 60 kilometers.<sup>59</sup> The follow-on to GMLRS, the MSTAR or MLRS Smart Tactical Rocket, has four submunitions candidates deadly to armored targets: SADARM; the low-cost autonomous attack submunition (LOCAAS) with a laser and radar sensor package; Damocles, with infrared and millimeter wave sensors and a parafoil that allows wide area searches; and the Brilliant Antitank (BAT) submunition,<sup>60</sup> which also uses infrared and millimeter wave technology.<sup>61</sup> While neither GMLRS nor MSTAR are designed for the close fight, they'll help the maneuver commander shape the battle to his advantage.<sup>62</sup>

ATACMS is also designed to allow the commander to shape the battle. The current Block I ATACMS uses a guidance section to accurately attack targets with 950 dual purpose bomblets out to a range of 165 kilometers and will soon have a range of 300 kilometers. In four years, Force XXI will be able to engage moving, armored targets with BAT submunitions delivered by the Block II ATACMS.<sup>63</sup> Like MLRS, ATACMS gives the maneuver commander the capability to attack the enemy with devastating fires at long ranges disrupting the enemy's operational tempo and diminishing his combat power advantage.

**3. Joint fire support systems.** Help will also be available from the other services. Airpower has always been able to

quickly shift combat power ratios. While it seems likely the Air Force will retire the old airframe that was the Gulf War's premiere tank killer, the A-10 Warthog, there are several other ground attack fighters that deliver highly lethal ordnance, and new fighters will soon enter the inventory. The Air Force's F-22, under development now, while predominantly an air superiority fighter, will also have significant ground attack capabilities, and the Joint Strike Fighter, a joint Air Force, Navy and Marine aircraft, could be available as early as 2008.<sup>64</sup> 21<sup>st</sup> Century technology will make it an extremely lethal ground attack platform.

The Navy is also developing other fire support systems that can provide overwhelming fires well inland. The first is the Vertical Gun for Advanced Ships (VGAS), a 155mm gun able to attack targets 100 nautical miles inland. The Navy will put the VGAS on refitted Aegis cruisers and possibly on other ships with ground support roles.<sup>65</sup>

Other advances in Naval Surface Fire Support include an Extended Range Guided Munition (ERGM) and a supersonic land attack missile. The VGAS-fired ERGM will combine a Global Positioning System receiver with an inertial navigation system and dual purpose submunitions that can destroy armored targets<sup>66</sup> and will be effective at a range of 75 nautical miles.<sup>67</sup> The supersonic missile will have several variants capable of maximum ranges from 80 to 230 nautical miles. These missiles will reach

speeds up to Mach 4.5 allowing extremely short flight times, and consequently decreased response time, with increased impact lethality.<sup>68</sup>

To attack deeper targets, the Navy is developing a tactical Tomahawk cruise missile. The tactical Tomahawk will have the ability to store 15 programmed target areas and loiter in a holding position for two hours waiting for a lucrative target. When released to a target area, the Tomahawk will accurately deliver smart submunitions to destroy tactical targets, like a column of tanks.<sup>69</sup>

**4. Fire control.** Tying all these fire support assets together in order to get the best weapon system to service each target will be a challenge. However, the Army already has a system in the field capable of doing just that, the Advanced Field Artillery Tactical Data System (AFATDS). AFATDS allows complete fire support integration throughout the depth and breadth of the battlefield. It will control all cannon, rocket and missile fires. It interfaces with current and future Air Force mission planning systems<sup>70</sup> and allows access to the daily Air Tasking Order.<sup>71</sup> This helps deconflict air operations with ATACMS, MLRS and cannon fire.<sup>72</sup> The Navy is looking at adopting AFATDS to control its surface fires,<sup>73</sup> and AFATDS is interoperable with several of our allies' fire control systems, including the German ADLER, the British BATES, and the French

ATLAS.<sup>74</sup> It's truly a joint and combined method of controlling and maximizing fire support and will control fires for Force XXI and, until a better system is designed, for AAN.<sup>75</sup>

**5. Targeting.** Targeting for Force XXI and AAN will take advantage of the perfect picture of the enemy offered by information dominance. There will be so many target acquisition systems on and over the battlefield that fire supporters will have a target rich environment. The Joint Surveillance Target Acquisition Radar System (JSTARS) will be one of the most important targeting systems. Mounted on an Air Force E-8 aircraft, JSTARS is a wide-area surveillance and targeting radar.<sup>76</sup> It detects moving and stationary targets<sup>77</sup> with such accuracy that ATACMS, MLRS, cannons and other fire support systems can attack them well beyond the visual range of a forward observer.<sup>78</sup> Force XXI and AAN brigades can expect to have a ground station module that ties them directly to an orbiting JSTARS.<sup>79</sup> Unmanned Aerial Vehicles (UAVs) will be another key Force XXI and AAN target acquisition system. UAVs will fly all over the battlefield and allow brigade commanders to see and target enemy units 100 kilometers away.<sup>80</sup> Forward observers with greatly improved optics and laser rangefinder-designators will pick up the fight as the enemy moves closer, and the All-Source Analysis System (ASAS) will tie all these systems and other strategic and tactical sensors together. It will rapidly

disseminate overall situation and targeting information to commanders and shooters<sup>81</sup> to allow them to most effectively utilize all fire support systems.

## CONCLUSION

Combat power, even in the 21<sup>st</sup> Century, will entail more than just knowledge and speed of maneuver. While The Annual Report on the Army After Next clearly addresses the need for fires to help the force take advantage of its agility,<sup>82</sup> its emphasis is unmistakably on knowledge and speed, and it almost seems to disparage fires. For instance, it says,

...if not corrected soon, the current emphasis on a method of warfighting that emphasizes firepower at the expense of maneuver may well result in a protracted war characterized by stalemate, attrition, and unacceptable loss of life to both sides.<sup>83</sup>

It also says,

Perhaps in our continued rush to embrace precision warfare we might find ourselves embracing a method of fighting that grows increasingly obsolete and more irrelevant with each passing day.<sup>84</sup>

Possibly, the advocates for a knowledge and speed based force are simply trying to counter recent arguments for the "ascendancy of fires."<sup>85</sup> Officers like General (Retired) Glenn K. Otis, former commander in chief of U.S. Army Europe, and MG Randall L. Rigby, former commandant of the Field Artillery School have expressed the thought that in future warfare, firepower will be the dominant factor.<sup>86 87</sup> Retired Brigadier General Huba Was de

Czege, former Assistant Division Commander for the 1st Infantry Division (Mechanized) and well known for being forward-looking, after observing the effectiveness of precision munitions during the Prairie Warrior Exercise at Fort Leavenworth in 1996, said, "I am convinced this capability will define future tactics."<sup>88</sup>

However, reliance on fire support to be the dominant battlefield force makes no more sense than relying primarily on knowledge and speed, and I am not suggesting we do that. Fire support is not the silver bullet that will dominate combat in the 21st Century. It is, simply, an essential element of combat power that will be just as vital in the next century as it is today. Fire support can bridge the potential combat power gap between our fast, small, information-dependent forces of the early 21st Century and our potential enemies. We must consider it an essential element of Force XXI and Army After Next operations and not relegate it to a lesser role. Word Count:  
5,790

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<sup>3</sup> Tim Weiner, "U.S. Spy Agencies Find Scant Peril on the Horizon," The New York Times, 29 January 1998, sec. A, p.3.

<sup>4</sup> William J. Clinton, A National Security Strategy For A New Century (The White House, Washington, D.C.: n.p., 1997), 12.

<sup>5</sup> National Defense Panel, Transforming Defense: National Security in the 21st Century (Arlington, VA: National Defense Panel, 1997), 23.

<sup>6</sup> David A. Fulghum, "Two-War Strategy May Be Abandoned," Aviation Week & Space Technology (January 29, 1996), 40.

<sup>7</sup> John R. Brinkerhoff, "The Brigade-Based New Army," Parameters 47 (Autumn 1997), 60.

<sup>8</sup> Sean D. Naylor, "A Lieutenant Colonel with a View," Army Times (June 9, 1997), 13.

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<sup>10</sup> Ibid., 69-82 & 128-130.

<sup>11</sup> Naylor, 13.

<sup>12</sup> Brinkerhoff, 69.

<sup>13</sup> Naylor, 13.

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<sup>16</sup> Department of the Army, Force XXI Operations: A Concept for the Evolution of Full-Dimensional Operations for the Strategic Army of the Early Twenty-First Century, TRADOC Pamphlet 525-5 (Fort Monroe, VA: Department of the Army, 1 August 1994), 3-1 & 3-2.

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<sup>20</sup> George C. Wilson, "Rating the Experimental Force at the NTC: EXFOR Performance Comes Under Scrutiny," Army Times (May 26, 1997), 3.

<sup>21</sup> Department of Defense, 47.

<sup>22</sup> The Annual Report on the Army After Next Project to the Chief of Staff of the Army (Washington, D.C.: Department of the Army, 1997), 1.

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- <sup>25</sup> MG Robert H. Scales, Jr., "Cycles of War," Armed Forces Journal International (July 1997), 41.
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- <sup>28</sup> Ibid., 13.
- <sup>29</sup> Ibid.
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